

WHAT IS CLAIMED IS:

- 1 1. A device for lining a vessel, comprising:
2 an expandable anchor movable from a collapsed shape to an expanded shape;
3 a liner attached to the anchor;
4 an inner layer, the liner being mounted over the inner layer; and
5 an outer layer extending over the liner and the anchor, the outer layer being
6 attached to the outer layer, the outer layer being retracted to expose the liner when the
7 outer layer is moved proximally relative to the inner layer.

- 1 2. The device of claim 1 wherein:
2 the outer layer holds the anchor in the collapsed position.

- 1 3. The device of claim 1 wherein:
2 the outer layer has a thickness of 0.0005-0.002 inch.

- 1 4. The device of claim 1 wherein:
2 the outer layer stretches over a tapered portion, the outer layer stretching as it
3 passes over the tapered portion when the outer layer is moved proximally relative to
4 the inner layer.

- 1 5. The device of claim 1 further comprising:
2 an inner element attached to the inner layer.

- 1 6. The device of claim 5, wherein:
2 the inner layer has a thickness of 0.0005-0.002 inch.

- 1 7. The device of claim 1 wherein:
2 the outer layer has a diameter of no more than 0.055 inch when in the
3 collapsed position.

- 1 8. The device of claim 1 wherein:

2 the outer layer has a diameter of no more than 0.050 inch when in the
3 collapsed position.

1 9. The device of claim 1 wherein:
2 the outer layer applies a compressive force to the liner to hold the liner in the
3 collapsed position.

1 10. The device of claim 1 wherein:
2 the outer layer lies directly over the anchor and holds the anchor in the
3 collapsed position, the outer layer being retracted by the outer element to expose the
4 anchor and permit the anchor to move to the expanded position.

1 11. The device of claim 1 wherein:
2 the liner is collapsed by forming a number of folds.

1 12. The device of claim 1 wherein:
2 the liner is made of expanded PTFE.

1 13. The device of claim 1 further comprising:
2 a radiopaque coil extending beyond the distal end of the liner and being
3 positioned at least partially between the inner and outer layers.

1 14. The device of claim 13, wherein:
2 the radiopaque coil extends beyond the distal end of the inner and outer layers.

1 15. The device of claim 1 wherein:
2 the inner and outer layers extend beyond a distal end of the liner, the outer
3 layer tapering distally and being flexible enough to expand over the tapered section
4 when the outer layer is retracted relative to the inner layer.

1 16. The device of claim 1 wherein:
2 the inner liner is attached to an inner element, the inner element engaging the
3 anchor to hold the anchor when the outer layer is retracted relative to the inner layer.

1 17. The device of claim 16, wherein:
2 the inner element is spiral cut at a distal end.

1 18. The device of claim 17, wherein:
2 the inner element has a lumen for receiving a guidewire, the lumen having a
3 diameter of 0.015-0.25 inch.

1 19. The device of claim 1 wherein:
2 the anchor has a length of less than 15 mm when collapsed.

1 20. A method of lining a vessel, comprising the steps of:
2 providing an expandable anchor, a liner, an inner layer, and an outer layer, the
3 anchor and liner being movable from a collapsed shape to an expanded shape, the
4 liner being attached to the anchor and extending from an end of the anchor, the outer
5 layer being slidable relative to the inner layer, the outer layer extending over the liner
6 and the anchor extending over the liner and anchor in the collapsed position;
7 advancing the device to a treatment site; and
8 retracting the outer layer to expose the liner and the anchor to permit the
9 anchor to expand.

1 21. The method of claim 20 wherein:
2 the providing step is carried out with the outer layer holding the anchor and the
3 liner in the collapsed position.

1 22. The method of claim 20 wherein:
2 the providing step is carried out with the outer layer having a thickness of
3 0.0005-0.002 inch.

1 23. The method of claim 20 wherein:
2 the providing step is carried out with the outer layer having a tapered portion
3 when the anchor is in the collapsed position; and

4 the retracting step is carried out with the outer layer stretching over the tapered
5 portion as it passes over the tapered portion.

1 24. The method of claim 23, wherein:

2 the providing step is carried out with the inner layer having a thickness of
3 0.0005-0.002 inch.

1 25. The method of claim 20 wherein:

2 the providing step is carried out with the outer layer having a diameter of no
3 more than 0.050 inch when in the collapsed position.

1 26 The method of claim 20 wherein:

2 the providing step is carried out with the outer layer having a diameter of no
3 more than 0.045 inch when in the collapsed position.

1 27. The method of claim 20 wherein:

2 the providing step is carried out with the outer layer lying directly over the
3 anchor to hold the anchor in the collapsed position;
4 the retracting step being carried out so that the outer layer is retracted to expose the
5 anchor and permit the anchor to expand.

1 28. The method of claim 20 wherein:

2 the providing step is carried out with the liner collapsed by forming a number
3 of folds which are folded around one another.

1 29. The method of claim 20 wherein:

2 the providing step is carried out with the liner being made of expanded PTFE.

1 30. The method of claim 20 further comprising the step of:

2 advancing a medical device into the liner after the retracting step.

1 31. The method of claim 30, wherein:

2 the advancing step is carried out with the medical device being a medical
3 device selected from the group consisting of a stent, an angioplasty balloon, a filter, a
4 drug delivery device, and an atherectomy device.

1 32. The method of claim 20 wherein:
2 the providing step is carried out with the inner layer being attached to an inner
3 element; and
4 the retracting step is carried out with the inner element contacting the anchor
5 to hold the anchor in place while retracting the outer layer.

1 33. The method of claim 32, wherein:
2 the providing step is carried out with the inner element having a lumen for
3 receiving a guidewire, the lumen having a diameter of 0.015-0.25 inch.

1 34. The method of claim 20 wherein:
2 the providing step is carried out with the outer layer attached to an outer
3 element; and
4 the retracting step is carried out with the outer element being retracted with the outer
5 layer.

1 35. The method of claim 20 wherein:
2 the providing step is carried out with a radiopaque coil extending beyond the
3 distal end of the liner and being positioned at least partially between the inner and
4 outer layers.

1 36. The method of claim 35, wherein:
2 the providing step is carried out with the radiopaque coil extending beyond the
3 distal end of the inner and outer layers.

1 37. The method of claim 20 wherein:
2 the providing step is carried out with the anchor having a length of less than 15
3 mm when collapsed.

1 38. A method of opening a narrowed region in a blood vessel, comprising
2 the steps of:

3 providing a liner movable from a collapsed condition to an expanded
4 condition;

5 advancing the liner to a narrowed region of a blood vessel with the liner in the
6 collapsed position;

7 passing at least a portion of the liner through the narrowed region of the blood
8 vessel in the collapsed position;

9 positioning a stent in the liner so that the stent is also positioned in the
10 narrowed region of the blood vessel, the liner preventing the stent from contacting the
11 narrowed region of the blood vessel; and

12 expanding the stent to open the narrowed region of the vessel.

1 39. The method of claim 38, wherein:

2 the advancing and passing steps are carried out with the blood vessel being a
3 vessel selected from the group comprising the internal carotid artery and saphenous
4 vein graft.

1 40. The method of claim 38, further comprising the step of:

2 expanding the liner before expanding the stent.